

## 2010 Underground #2 Fuel Oil Storage Reminder List

### Applicable Codes and Standards

CBC 2010, CEC 2010, CMC 2010, CFC 2010, California Health & Safety Code  
 NFPA 30 2008, NFPA 37 2006, NFPA 110 2005, NFPA 55 2005

#### I. Scope

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|----|--|---|
| 1. | Emergency and standby power systems required by the California Building Code or the California Fire Code shall be installed in accordance with the California Building Code and NFPA 110.  | <b>CBC, Sec. 2702.1</b>                 |
| 2. | Prevention, control and mitigation of dangerous conditions related to storage, use, dispensing, mixing and handling of flammable and combustible liquids shall be in accordance with California Fire Code Chapter 27 and Chapter 34. | <b>CFC Sec. 3401.1</b>                  |
| 3. | Flammable and combustible liquids shall not be placed, stored or handled in any occupancy within the scope of California Code of Regulations, Title 19, Division 1 regulations, except as provided in the California Fire Code.      | <b>CCR, Title 19, Div. 1, Sec. 3.15</b> |

**CHK**

**N/A**

#### I. Generator Fuel Supply

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|--------------------------|--------------------------|--|--|
| <input type="checkbox"/> | <input type="checkbox"/> | 1. Minimum fuel supply of 24 hrs. for acute care hospital. (Min 72 hrs. for NPC-5)   | <b>CEC 700-12(B)(2)Exc.1</b>                       |
| <input type="checkbox"/> | <input type="checkbox"/> | 2. Minimum fuel supply of 6 hrs. for SNF, Psych, ICF.  | <b>CEC 700-12(B)(2)Exc.2</b>                       |
| <input type="checkbox"/> | <input type="checkbox"/> | 3. Minimum fuel supply of 4 hrs. for ambulatory surgery clinics.   | <b>CEC 700-12(B)(2)Exc.3</b>                       |
| <input type="checkbox"/> | <input type="checkbox"/> | 4. <i>Minimum fuel supply of 96 hours in seismic risk areas designated as zones 3 and 4 of the Uniform Building Code. Not a CBC requirement. Required for CDPH, CMS and TJC approvals.</i>                           | <i>NFPA 110-1999,<br/>Sec. 3-1.2</i>               |
| <input type="checkbox"/> | <input type="checkbox"/> | 5. Liquid fuel shall feed to engines by pumps only.  | <b>NFPA 37, Sec. 6.9</b>                           |
| <input type="checkbox"/> | <input type="checkbox"/> | 6. Fuel supply for exclusive use of EPSS or separate draw down.  | <b>NFPA 110, Sec. 5.5.1<br/>&amp; Sec. 5.5.1.1</b> |
| <input type="checkbox"/> | <input type="checkbox"/> | 7. Main fuel tank(s) shall be sized to accommodate 133% of the specific EPS class.   | <b>NFPA 110, Sec. 5.5.3</b>                        |
| <input type="checkbox"/> | <input type="checkbox"/> | 8. Low-fuel sensing switch required for the main fuel supply tank(s) when less than the minimum fuel required for the specific EPS class remains in the tank(s).   | <b>NFPA 110, Sec. 5.5.2</b>                        |
| <input type="checkbox"/> | <input type="checkbox"/> | 9. Calculate generator fuel consumption.   | <b>NFPA 110, Sec. 7.9.1</b>                        |
| <input type="checkbox"/> | <input type="checkbox"/> | 10. Tanks shall be sized so that the fuel is consumed within the storage life, or provisions shall be made to remediate fuel that is stale or contaminated or to replace stale or contaminated fuel with clean fuel. | <b>NFPA 110, Sec. 7.9.1.3</b>                      |
| <input type="checkbox"/> | <input type="checkbox"/> | 11. Prior to being placed into service, tanks shall be tested in accordance with Section 21.5 of NFPA 30.  | <b>CFC, Sec. 3404.2.12.1</b>                       |
| <input type="checkbox"/> | <input type="checkbox"/> | 12. Low fuel annunciation at generator panel.  | <b>NFPA 110, Sec. 5.6.5.1</b>                      |
| <input type="checkbox"/> | <input type="checkbox"/> | 13. Low fuel annunciation at a remote location on-site or off-site.  | <b>NFPA 110, Sec. 5.6.6</b>                        |
| <input type="checkbox"/> | <input type="checkbox"/> | 14. <i>Low fuel annunciation at a constantly monitored location. Not a CBC requirement. Required for CDPH, CMS and TJC approvals.</i>  | <i>NFPA 99 - 1999,<br/>Sec. 3-4.1.1.15</i>         |
| <input type="checkbox"/> | <input type="checkbox"/> | 15. <i>Low fuel annunciation at regular work station of operating personnel. Not a CBC requirement. Required for CDPH, CMS and TJC approvals.</i>  | <i>NFPA 99 - 1999,<br/>Sec. 3-4.1.1.15</i>         |

**CHK**

**N/A**

#### II. Tank Installation

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|--------------------------|--------------------------|---|---|
| <input type="checkbox"/> | <input type="checkbox"/> | 1. CUPA (Certified Uniform Program Agency) review and approval required.  | <b>H &amp; S Code, § 25280<br/>et seq</b> |
| <input type="checkbox"/> | <input type="checkbox"/> | 2. Located with respect to existing foundations and supports such that the loads carried by the latter cannot be transmitted to the tank. | <b>CFC, Sec. 3404.2.11.2.1</b>            |
| <input type="checkbox"/> | <input type="checkbox"/> | 3. Tank location distance to wall of basement, pit, cellar or lot line not less than 3 ft.  | <b>CFC, Sec. 3404.2.11.2.2</b>            |

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|--------------------------|--------------------------|--|--|
| <input type="checkbox"/> | <input type="checkbox"/> | 4. Minimum distance of 1 ft. shell to shell between underground tanks.   | <b>CFC, Sec.<br/>3404.2.11.2.3<br/>NFPA 55, Sec. 9.3.2</b>                                       |
| <input type="checkbox"/> | <input type="checkbox"/> | 5. Tank, tank vent and tank filler locations in accordance with NFPA 55, Table 9.3.2.  | <b>CFC, Sec. 3404.2.3.1</b>  |
| <input type="checkbox"/> | <input type="checkbox"/> | 6. Signs prohibiting open flames and smoking.  | <b>CFC, Sec. 3404.2.11.3</b>   |
| <input type="checkbox"/> | <input type="checkbox"/> | 7. Set on a firm foundation and surrounded by at least 6 in. of noncorrosive inert material such as sand.  | <b>NFPA 30, Sec.<br/>23.5.2.1<br/>NFPA 30, Sec.<br/>23.5.2.2</b>                                 |
| <input type="checkbox"/> | <input type="checkbox"/> | 8. Covered by 12 in. of backfill and 12 in. of clean earth or 12 in. of compacted backfill and 4" slab of reinforced concrete.   | <b>NFPA 30, Sec.<br/>23.5.2.2</b>  |
| <input type="checkbox"/> | <input type="checkbox"/> | 9. Where subject to traffic, at least 36 in. of backfill or 18 in. of compacted backfill and at least 6 in. of reinforced concrete or 18 in. of compacted backfill and 8 in. of asphaltic concrete.  | <b>NFPA 30, Sec.<br/>23.5.2.3<br/>NFPA 30, Sec.<br/>23.5.3.2</b>                                 |
| <input type="checkbox"/> | <input type="checkbox"/> | 10. When asphaltic or reinforced concrete is used for protection, it shall extend at least 12 in. beyond the tank in all directions.   | <b>NFPA 30, Sec.<br/>21.5.1.2</b>  |
| <input type="checkbox"/> | <input type="checkbox"/> | 11. When the depth of cover is greater than the tank diameter or if the pressure at the bottom of the tank can exceed 10 psi, the manufacturer of the tank shall be consulted to determine if reinforcement of the tank is required.   | <b>CFC, Sec. 3404.2.7</b>  |
| <input type="checkbox"/> | <input type="checkbox"/> | 12. Where the vertical length of the fill and vent pipes is such that when filled with liquid, the static head on the tank bottom can exceed 10 psi, the tank and its piping shall be hydrostatically tested using recognized engineering standards.                         | <b>CFC, Sec. 3404.2.7.8</b>  |
| <input type="checkbox"/> | <input type="checkbox"/> | 13. Fabrication & construction of tanks complies with NFPA 30. See NFPA 30, Sections 21.4.1 & 21.4.2.  | <b>CFC, Sec. 3404.2.11.4</b>   |
| <input type="checkbox"/> | <input type="checkbox"/> | 14. Where a tank is located in an area where it is subject to buoyancy because of a rise in the water table, flooding or accumulation of water from fire suppression operations, uplift protection shall be provided in accordance with Sections 22.14 and 23.14 of NFPA 30. | <b>CFC, Sec. 3404.2.11.5.2<br/>CFC, Sec.<br/>3404.2.7.5.5.2<br/>CFC, Sec.<br/>3404.2.7.5.5.2</b> |
| <input type="checkbox"/> | <input type="checkbox"/> | 15. Fill pipes shall be equipped with a spill container and an overflow prevention system in accordance with NFPA 30.  | <b>NFPA 37, Sec. 6.5.4</b>   |
| <input type="checkbox"/> | <input type="checkbox"/> | 16. Provide an approved method of leak detection from any component of the system that is designed and installed in accordance with NFPA 30.   | <b>CFC, Sec.<br/>3404.2.7.5.2 &amp; Sec.<br/>3404.2.7.5.6</b>                                    |
| <input type="checkbox"/> | <input type="checkbox"/> | 17. Fill pipe and discharge lines shall enter only through the top of tank.  | <b>CFC, Sec. 3404.2.12.1</b>   |
| <input type="checkbox"/> | <input type="checkbox"/> | 18. Fill lines shall be sloped toward the tank.  | <b>CFC, Sec. 3404.2.12.2</b>   |
| <input type="checkbox"/> | <input type="checkbox"/> | 19. Fuel tanks supplied by pumps shall have (1) overflow line piped to source tank, (2) high level alarm and (3) high-level automatic shutoff.   | <b>NFPA 30, Sec. 23.3.4</b>  |
| <input type="checkbox"/> | <input type="checkbox"/> | 20. Filling, emptying and vapor recovery connections shall be located outside buildings, away from sources of ignition not less than 5 ft. from building openings or lot lines of property that can be built on, not more than 5 ft. above finished ground level.            |  |
| <input type="checkbox"/> | <input type="checkbox"/> | 21. Prior to being placed in service, tanks shall be tested in accordance with NFPA 30, Sec. 21.5. An approved listing mark on tank is evidence of compliance.   |  |
| <input type="checkbox"/> | <input type="checkbox"/> | 22. Before covering, tanks and connected piping shall be tested for tightness in the presence of the fire code official.   |  |
| <input type="checkbox"/> | <input type="checkbox"/> | 23. Tanks and piping shall be protected by a cathodic protection system or constructed of approved or listed corrosion-resistant materials or systems.   |  |

**CHK    N/A    VI. Generator Fuel Supply/Return Piping**

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|--------------------------|--------------------------|--|------------------------------|
| <input type="checkbox"/> | <input type="checkbox"/> | 1. Provisions shall be made for pressure testing of piping.                          | <b>CFC, Sec. 3403.6.3</b>    |
| <input type="checkbox"/> | <input type="checkbox"/> | 2. Protected from corrosion and galvanic action.                                     | <b>CFC, Sec. 3403.6.5</b>    |
| <input type="checkbox"/> | <input type="checkbox"/> | 3. Piping protected from vehicle damage by guard posts or other approved means.      | <b>CFC, Sec. 3403.6.4</b>    |
| <input type="checkbox"/> | <input type="checkbox"/> | 4. Supports protected by 2-hr fire rating or other approved means.                   | <b>CFC, Sec. 3403.6.8</b>    |
| <input type="checkbox"/> | <input type="checkbox"/> | 5. Approved metallic or nonmetallic flex connectors permitted to protect the piping. | <b>NFPA 37, Sec. 6.8.2.1</b> |

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|--------------------------|--------------------------|--|--|
| <input type="checkbox"/> | <input type="checkbox"/> | 6. Valves shall be provided to control normal flow and shut off flow for breaks.   | <b>NFPA 37, Sec. 6.8.3</b>                       |
| <input type="checkbox"/> | <input type="checkbox"/> | 7. Fuel piping shall be of compatible metal to minimize electrolysis and be properly sized.  | <b>NFPA 110, Sec. 7.9.3</b>                      |
| <input type="checkbox"/> | <input type="checkbox"/> | 8. Galvanized fuel lines shall not be used.  | <b>NFPA 110, Sec. 7.9.3.1</b>                    |
| <input type="checkbox"/> | <input type="checkbox"/> | 9. Approved flexible fuel lines shall be used between the prime mover and the fuel piping.   | <b>NFPA 110, Sec. 7.9.3.2</b>                    |
| <input type="checkbox"/> | <input type="checkbox"/> | 10. Fuel line solenoids shall be battery powered.  | <b>NFPA 110, Sec. 7.9.9 &amp; Sec. 5.6.3.2.1</b> |
| <input type="checkbox"/> | <input type="checkbox"/> | 11. EPS piping shall be designed to minimize damage from earthquakes.  | <b>NFPA 110, Sec. 7.11.5</b>                     |
| <input type="checkbox"/> | <input type="checkbox"/> | 12. Gravity return fuel lines between the day tank and main supply tank shall flow freely to the main tank.  | <b>NFPA 110, Sec. 7.9.4.2</b>                    |
| <input type="checkbox"/> | <input type="checkbox"/> | 13. Gravity feed to generator not permitted.   | <b>NFPA 37, Sec. 6.5.1</b>                       |
| <input type="checkbox"/> | <input type="checkbox"/> | 14. Spill control, drainage control & secondary containment not required for piping connected to systems. See ANSI/ASME B31.3  | <b>CFC, Sec. 3403.6.2</b>                        |
| <input type="checkbox"/> | <input type="checkbox"/> | 15. Listed flexible joints required on underground liquid, vapor and vent piping at tank connections, connections at pump islands, vent risers and where differential movement can occur.              | <b>CFC, Sec. 3403.6.9</b>                        |
| <input type="checkbox"/> | <input type="checkbox"/> | 16. Listed flexible joints are not required for fiberglass-reinforced piping $\leq$ 4 in. in dia. and piping has a straight run of not less than 4 ft. on one side of a connection changing direction. | <b>CFC, Sec. 3403.6.9.1</b>                      |

**CHK**    **N/A**    **VII. Tank Venting**

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|--------------------------|--------------------------|---|---------------------------------|
| <input type="checkbox"/> | <input type="checkbox"/> | 1. Vents for normal venting shall vent to exterior not less than 12 ft. above ground level and not less than 5 ft. from openings or lot lines of property that can be built on. | <b>CFC, Sec. 3404.2.7.3.3</b>   |
| <input type="checkbox"/> | <input type="checkbox"/> | 2. The vent pipe shall terminate outside the building at a point at least 24 in. from any building opening at the same or lower level.  | <b>NFPA 37, Sec. 6.7.1.1</b>    |
| <input type="checkbox"/> | <input type="checkbox"/> | 3. Piping for normal venting shall discharge vertically or horizontally and shall not be trapped by eaves or other obstructions.  | <b>CFC, Sec. 3404.2.7.3.3</b>   |
| <input type="checkbox"/> | <input type="checkbox"/> | 4. Piping for normal venting shall drain back to tank.  | <b>CFC, Sec. 3404.2.7.3.3</b>   |
| <input type="checkbox"/> | <input type="checkbox"/> | 5. Vent piping shall not be manifolded unless otherwise required.   | <b>CFC, Sec. 3404.2.7.3.5</b>   |
| <input type="checkbox"/> | <input type="checkbox"/> | 6. When vent piping is manifolded, piping shall be sized to prevent excessive pressure when tanks are filled simultaneously.  | <b>CFC, Sec. 3404.2.7.3.5.2</b> |
| <input type="checkbox"/> | <input type="checkbox"/> | 7. Normal vent line piping not used for any other purpose.  | <b>CFC, Sec. 3404.2.7.3.1</b>   |
| <input type="checkbox"/> | <input type="checkbox"/> | 8. Vent piping protected from vehicle damage by guard posts or other approved means.  | <b>CFC, Sec. 3403.6.4</b>       |

**NOTE**

**Compliance with all items on this list does not necessarily assure compliance with all provisions of the applicable codes and standards. This check list should be used only by persons with a comprehensive knowledge of the applicable codes and standards.**

OSHPD Policy Intent Notices and Code Application Notices.  
<http://www.oshpd.ca.gov/FDD/Regulations/CANs/index.html>  
 OSHPD Project Review Status  
[http://www.oshpd.ca.gov/FDD/project\\_status/index.asp](http://www.oshpd.ca.gov/FDD/project_status/index.asp)  
 OSHPD Public Use Forms  
<http://www.oshpd.ca.gov/FDD/Forms/index.html>